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**ADHESIVE FOR FLOOR MATERIAL**

[Yukazaiyo Secchakuzai]

Yasumasa Takao, Mitsuo Ito, and Mayumi Odajima

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Inventor : Yasumasa Takao, Mitsuo Ito, and  
Mayumi Odajima

Applicant : Tori K.K.

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## Specification

### 1. Title of the invention

Adhesive for Floor Material

### 2. Claims

1. An adhesive for a floor material, characterized by the fact that a vinyl acetate-Veoba[transliteration] copolymer or vinyl acetate-Veoba-acryl copolymer and a vinyl acetate-ethylene copolymer are used as binders; and fillers except for asbestos are mixed.

2. The adhesive for a floor material of Claim 1, characterized by the fact surfactants are mixed.

### 3. Detailed explanation of the invention

(Industrial application field)

The present invention pertains to an adhesive for a floor material that has a long attachable time and is easily applied.

(Prior art and its problems)

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

Vinyl acetate resin group solvent type adhesives have been mixtures in which a surface is added in the presence of asbestos, a vinyl acetate-Veoba (or vinyl acetate-Veoba-acryl) and a vinyl acetate-ethylene copolymer are respectively independently used as binders, and polar organic solvents such as methanol are included.

In the above-mentioned solvent type adhesive, since the asbestos itself has an alkalinity and exhibits a thixotropy, the adhesive has frequently been used. On the other hand, it is designated in harmful mineral powder dusts in the labor safety sanitation method, and there is a problem in terms of work environments. Currently, the adhesive tends to be unused.

On the other hand, if the asbestos is removed from the fillers, the attachable time is extremely shortened, and lots of problems in terms of working remain.

Also, in Japanese Kokoku Patent No. Sho 46[1971]-4838, an alcohol solvent type adhesive to which a vinyl acetate-ethylene copolymer is added is presented, and since a vinyl acetate homopolymer is included, the adhesive is hydrolyzed by an alkali water, so that the total adhesive strength is insufficient. Also, since the asbestos is included in the above-mentioned specification, it is not preferable in terms of environment preservation.

(Means to solve the problems)

The present invention solves the above-mentioned problems, pertains to a solvent type adhesive with good workability and /2 adhesive strength in which the open time is not extremely shortened, even by removing asbestos from fillers. Its essence is an adhesive for a floor material characterized by the fact An adhesive for a floor material, characterized by the fact that a vinyl acetate-Veoba copolymer or vinyl acetate-Veoba-acryl copolymer and a vinyl acetate-ethylene copolymer are used as binders; and fillers except for asbestos are mixed.

The synthetic resin binder being used in the present invention is a mixture of a vinyl acetate-Veoba copolymer or vinyl acetate-Veoba-acryl monomer copolymer and a vinyl acetate-ethylene copolymer (EVA).

The acryl monomer, for example, is an ordinary acryl group monomer mainly composed of acrylic ester and methacrylic acid ester.

The vinyl acetate-Veoba or vinyl acetate-Veoba acryl and the EVA are mixed at a weight ratio of 1:10-10:1, preferably 1:1-2:1.

As the solvents in the present invention, lower alcohols such as methanol and ethanol are used.

In the present invention, asbestos is removed from the fillers, and as the other additives, attapulgite, sepiolite, etc., are mixed at 5-20 parts by weight to the above-mentioned synthetic resin binder at 100 parts by weight. As fillers other than them, conventional well-known substances such as calcium carbonate, talc, clay, and diatomaceous earth other than the asbestos can be used, and they are harmless materials in terms of labor safety sanitation. These fillers can be used alone or in combination of two kinds or more, if necessary, and if these fillers are used, for example, they are mixed at usually 20-400 parts by weight, preferably about 50-250 parts by weight to the binder resin at 100 parts by weight.

In the present invention, surfactants are preferably used to extend the attachable time.

If the above-mentioned surfactants are added at 0.1-5 wt%, preferably 0.5-1.5 wt% of the binder resin in the adhesive composition of the present invention, the attachable time is extended, and the adhesive can be easily used for floor materials, etc.

The attachable time in the present invention is a usable time and is a period in which a usable liquid shape or attached state after spreading.

As detailed examples of these surfactants, (I) polyoxyethylene lauryl ether, polyoxyethylene cetyl ether, polyoxypropylene cetyl ether, etc., (II) sorbitan monolaurate, sorbitan monopalmitate, sorbitan monostearate, etc., (III) polyoxyethylene monolaurate, polyoxyethylene monostearate, polyoxypropylene monolaurate, etc., (IV) sodium lauryl sulfate, lauryl alcohol sulfuric ester triethanolamine salt, potassium stearate sulfate, etc., (V) myristyl phosphate potassium salt, dilauryl phosphate sodium salt, palmityl phosphate sodium salt, etc., can be mentioned.

The constitution of the present invention is an adhesive composition in which, a lower alcohol solution is added to the binder of the present invention as a mixture of vinyl acetate-Veoba copolymer or vinyl acetate-Veoba-acryl copolymer and EVA and fillers except for asbestos are mixed. The attachable time of the adhesive is long, and in particular, the adhesion with PVC is improved. This adhesive is suitable as an adhesive for PVC floor materials, and the water resistance and the alkali resistance are also improved. In this adhesive, a vertical practical attachable time is exhibited, even at high temperature.

(Application examples)

Adhesives shown in Application Examples 1 and 2 and Comparative Examples 1-4 with compositions as shown in Table I were obtained.

The above-mentioned adhesives were spread on a slate plate (including an alkali), a floor material was attached to it, and its peeling strength was measured.

The performances of the adhesives obtained were shown in Table II.

Table I

	Application Example		Comparative Example			
	1	2	1	2	3	4
Vinyl acetate-Veoba	50	80	100			100
EVA	50	20		100	50	
Vinyl acetate					50	
Methanol	115	115	115	115	115	115
Attapulgate	20	20	20	20	20	
Calcium carbonate	100	100	100	100	100	
Asbestos						135
Surfactant	1	1	1	1	1	1



Table II

/3

		Application Example		Comparative Example			
		1	2	1	2	3	4
Viscosity(cps)		35,000	35,000	30,000	40,000	35,000	40,000
Attachable Time (min)	5°C	200	200	250	250	250	300
	20°C	70	70	45	50	70	70
	30°C	35	35	10	15	20	20
Peeling Strength Kg/inch	normal state	5	5	4.5	5	2.5	4.5
	Water resistance	1.5	1.5	1.5	1.5	1	1.5
Environmental safety	o	o	o	o	o	o	x
Applicability as an adhesive	o	o	x	x	x	x	x

In Application Examples 1 and 2, an appropriate viscosity was exhibited, and in particular, even at 20°C and 30°C, the attachable time was largely extended, compared with Comparative

Examples 1 and 2. Also, the states of Application Examples 1 and 2 and the water-resistant peeling strength were good.

Also, the environmental safety was excellent, and adhesives with excellent overall performances were obtained.

On the other hand, in Comparative Examples 1 and 2, the attachable time was short at 20°C and extremely short at 30°C, and the workability in summer fields were inferior.

In Comparative Example 3, the attachable time at 30°C was shorter than that of the application examples, and the peeling strength was lowered.

Also, asbestos was used in Comparative Example 4, and the adhesive was inappropriate.

From the above-mentioned results, the adhesive of the present invention was excellent in working at high temperature (summer season), and without adding asbestos, excellent peeling strength and environmental safety were obtained.

(Effects of the invention)

(1) Even without adding asbestos, good performances were obtained, and this additive was good in terms of environmental preservation.

(2) This additive had a thixotropy characteristic, the spreading performance was good, and a high strength and a long attachable time were obtained.

(3) At high temperature, a long attachable time was obtained in this adhesive, compared with adhesives containing asbestos in fillers, and the floor material working in summer fields was more effective.

(4) The water-resistant and alkali-resistant adhesive strength was excellent.